

**WHAT IS CLAIMED IS:**

- 1     1.     A hybrid power supply comprises:  
2             a switching type DC/DC boost type converter that receives energy from a primary  
3     battery cell and is arranged to deliver the energy to a rechargeable cell, set to provide a fixed  
4     output voltage that is less than the full charge voltage of the rechargeable cell.
- 1     2.     The hybrid power supply of claim 1, further comprising:  
2             a circuit including a primary battery current control that senses primary battery  
3     current, and controls in part operation of the converter to provide constant current discharge  
4     on the primary battery side of the hybrid power supply.
- 1     3.     The hybrid power supply of claim 1, wherein the circuit further comprises:  
2             a primary current sense amplifier/comparator and a power shutdown circuit to shut  
3     down the primary current sense amplifier/comparator.
- 1     4.     The hybrid power supply of claim 1 wherein the control circuit further comprises:  
2             a pair of external resistors coupled to the feedback input of the converter to adjust the  
3     fixed output voltage to be less than the full charge voltage of the rechargeable cell.
- 1     5     The hybrid power supply of claim 1 wherein the primary battery is an alkaline cell,  
2     Zn-air cell, fuel cell, solar cell, or another current limited power source.
- 1     6     The hybrid power supply of claim 1 wherein the rechargeable battery is a Li-Ion or  
2     Li-Polymer rechargeable cell.
- 1     7     The hybrid power supply of claim 1 wherein the primary battery control comprises:  
2             operational amplifier with a primary battery current sensing resistor to provide  
3     primary battery current control, having the output of the amplifier coupled to the closed  
4     feedback loop of the converter.
- 1     8.     The hybrid power supply of claim 9 wherein the closed feedback loop of the converter  
2     further comprises:

3 a resistor coupled between output and feedback terminals of the converter.

1 9. The hybrid power supply of claim 1 wherein the circuit delivers an output voltage that  
2 corresponds to about 90% charge of the rechargeable cell.

1 10. A hybrid power supply comprises:

2 a switching type DC/DC boost type converter that receives energy from a primary cell  
3 and is arranged to deliver the energy to a rechargeable cell;

4 a circuit disposed to control the switching type DC/DC converter, the circuit  
5 comprising:

6 a resistor voltage divider coupled to the feedback input of the converter, selected to  
7 provide a fixed output voltage that is less than the full charge voltage of the rechargeable  
8 cell.

1 11. The hybrid power supply of claim 1, further comprising:

2 a primary battery current sensor/comparator, included in the feedback control loop of  
3 the DC/DC converter, which controls in part operation of the converter to provide constant  
4 current discharge on the primary battery side of the hybrid power supply.

1 12. The hybrid power supply of claim 12 wherein the primary cell is an alkaline cell, Zn-  
2 air cell, fuel cell or solar cell, or another current limited power source.

1 13. The hybrid power supply of claim 12 wherein the rechargeable cell is Li-Ion or Li-  
2 Polymer rechargeable cell.

1 14 The hybrid power supply of claim 15 wherein the circuit delivers an output voltage  
2 that corresponds to about 90% charge of the rechargeable cell.

1 15 A method of operating a hybrid power supply comprises:

2 delivering energy from a primary cell to a rechargeable cell through a switching type  
3 DC/DC boost type converter at a fixed voltage that is less than the full charge voltage of the  
4 rechargeable cell.

1        16.    The method of claim 15, further comprising:  
2        controlling a circuit that senses primary battery current, and controls in part operation of the  
3        converter to provide a constant current discharge on the primary battery side of the hybrid  
4        power supply.

1        17.    The method of claim 15 wherein the primary cell is an alkaline cell, Zn-air cell, fuel  
2        cell or solar cell, or another current limited power source.

1        18.    The method of claim 15 wherein the rechargeable cell is Li-Ion or Li-Polymer  
2        rechargeable cell.

1        19       The method of claim 15 wherein the circuit delivers an output voltage that  
2        corresponds to about 90% charge of the rechargeable cell.